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# MADROÑO

A WEST AMERICAN JOURNAL OF  
BOTANY



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# MADROÑO

## A WEST AMERICAN JOURNAL OF BOTANY

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## THE SIGNIFICANCE OF CERTAIN PLANT NAMES

CARL SUMNER KNOPF

Botanical terminology is filled with oddities. An ancient Roman would probably find much amusement in the atrocious Latinesque mongrels, denoting that Smith, Ph.D., found and classified the Something-or-other Smithii. However, in many common and technical designations there is hidden a veritable romance of linguistic adventure, where research leads across seas and sands to natural habitats and original appellations.

In giving derivation of English words and common scientific terms, dictionaries often stop with Latin or Greek forms. Occasionally, reference will be made to Arabic. Yet many Graeco-Latin words were dialectic modifications of borrowed Near Eastern terms which were names of articles of trade peddled by Aramean and Phoenician merchants.

The family, Boraginaceae, has generally been identified with the Mediterranean littoral and eastward. Littré (*Dictionnaire de la Langue Française*), speaks of it as a "Plante Sudorifique, originaire d'Afrique et introduite par les Maures en Espagne." It was long known for cardial and febrifuge properties. Gerarde (1597) noted that borage was used in salads "to make the mind glad." Britain's famed "cool tankard" combined the leaves with wine, water, lemon and sugar. Great healing power was accredited to borage. The roots yielded brown and purple dye.

If this plant or some special use of it was introduced into Spain by the Moors, an oriental ancestry of its name would be logical. The scattered variant forms are easily recognizable, as German *boretsch*, French *bourranche*, Italian *borraggine*, Spanish *borraja*, Latin *borego*, and in all probability, Greek *pourakion*. Some have tried to connect the term with Latin *burra*, "a hairy cloth," or French *bourre*, "animal hair," since the group is notably hirsute.

Among the Arabs the plant is known as *barwaq*. Boiled with olive oil and vinegar it is a specific for jaundice. The root juice is used for skin eruptions; the juice of the leaves sometimes mixed with food "to cause excitement." In Zerolo's "*Diccionario Enciclopédico de la Lengua Castellana*," the Spanish *borrachuela* is described as causing "cierta perturbacion." Both Arab and Spaniard note the mild intoxication. Their terms are philologically related, the Arabic *q* passing over into Spanish *ch* and *j*, *borraja* and *borrachuela*, French *bourrache*.

Linguists long pondered over the origin of the Spanish term *borracho*, "drunk." Obviously it follows the same consonantal root pattern, *b-r-g/j/q/ch* always connected with some kind of exciting, mind-confusing state and a plant juice inducing it. An

Arabic word, *baraq*, means "to be confused," "weak," or "with eyelids immovable." A noun, built on the same root structure, *barqat*, means a "fit of confusion" or "blind perplexity." In Spanish, confusion of judgment is *borrachez*. Since Arabic *q* is formed back of the palate, it passes easily into Spanish *ch*, while the dental *t* as readily becomes a voiced sibilant, *z*.

Following the same intoxication motif, an Arabic wine basin is called an *ibriq*, and the Spanish leather wine bottle is a *borrachá*. Again the familiar b-r-g/q/ch of borage is clear. In spring, every vivid patch of fiddleneck (the *Amsinckia intermedia* of Oregon and *A. Douglasiana* of California) or heliotrope, or forget-me-not (*Myosotis*) can give the scholarly observer the mild intoxication of adventure—to Merrie England and old borage remedies; to France and her "plante sudorifique"; to Moorish Spain and convivial *borrachos*; to Arabia concocting jaundice medicine; to Italy where Roman tongues twisted a foreign term from the eastern provinces, while in Greece, Hellenic tongues did the same. The mucilaginous, sudorific, emollient, cooling, stimulating, hirsute borage carries a story in its name.

Cotton is equally revealing. The Arab long ago knew *qutun*. If he affixed the definite article it was *al-qutun*, which became Spanish *algodon* and Portuguese *algadao*. Spanish cotton cloth became *coton*.

The ancient Greeks, still barbarians when the Phoenicians were civilized sophisticates, bought many a novelty from the Near East. The well-made *kitunah* became the most popular article of Greek clothing, the *xiton*.<sup>1</sup> The name probably came from a Semitic root, k-t-n, "to clothe." In Assyrian, a word *xatanu* meant "protect." *Xutenu* meant "protection" and, incidentally, sounded quite like the Greek *xiton* and Phoenician *kitunah*. An Assyro-Babylonian *xittu* was a "border," like the ruffles on a garment.

Through all the terms runs a basic idea—a garment; woven stuff; protection; clothing; fringe. The common throat sounds for the idea are a glottal stop, a dental, and a dental-nasal—k/q/x/-t-n. It became stabilized in Arabic *qutun*, and emerged in English as "cotton." Back of it was Phoenicio-Aramaic *kitunah*; and back of that, Assyro-Babylonian *xatanu* and *kitunnu*.

Speaking of cotton (of the family Malvaceae, genus *Gossypium*) reminds one that this family name, Latin *malva*, garbled into Anglo-Saxon *mealwee*, has also a distinct Near East connection. When the Greeks called mallow *malaxe*, they left a linguistic clue, pointing to some term that included an extra consonant, *x*. The Greek *malakos*, suggested "soft" and mallow has been used in medicine as an emollient. In the Greek words the extra sound of a guttural *xi* or *kappa* (k) is clear.

<sup>1</sup> X is used to denote the throaty, raspy, guttural, like a half-swallowed k or q, indicated by Greek *xi* and Semitic *xeth*.



Turning to Near East literature, one finds in the great book of Job (30: 4) the old man's plaint that everybody laughs at his suffering, and even the "salt-weed" or "mallow" cutters deride him. The Palestinian Negeb or south country is volcanic and saline. Spring torrents bring down mineral salts from the hills. Water holes turn salty and crystals often line the edges. Even the Babylonian texts refer to this salt country. The nomad population adapted its resources to their needs. Every edible or therapeutic plant had to yield its benefit.

When Job mentioned the mallow cutters he used the term *malluax*. The final consonant, *xeth*, had much the same guttural sound as Greek *xi*. References to the salt lands in Psalms (107: 34) and Jeremiah (17: 6) employed the same root. In Babylonia, a *malaku* was a sailor, one identified with salty waters. In passage from the cradle of civilization to and through the Mediterranean tongues, the glottal stop, *k*, or guttural *x*, could be easily lost, leaving the softer *malva*, *malba*, and *mallow*. But the presence of the extra consonant in some of the Greek terms provides the clue pointing to oriental habitat and initial use of the mallow.

The philological background of botanical nomenclature can not be expected to provide complete implementation for habitat and dispersion studies, but there are possible suggestions. Certainly the linguist can clasp hands with the botanist when he finds basic word patterns such as *b-r-g*, *k-t-n*, or *m-l-x* stretching from Persia to the Pacific.

Willamette University, Salem, Oregon,  
January 12, 1942.

## NOTES ON THE FLORA OF THE CHARLESTON MOUNTAINS, CLARK COUNTY, NEVADA. IV.<sup>1</sup>

### ASTRAGALUS

IRA W. CLOKEY

For assistance in the study of the *Astragali* of the Charleston Mountains and for affording me the use of the Pomona College Herbarium, including the Marcus E. Jones Herbarium, I wish to express thanks to Dr. Philip A. Munz. Appreciation is also extended to the curators of the herbaria of the United States National Museum, the New York Botanical Garden and the University of California for the loan of type and critical specimens. I also wish to thank Mr. Rupert C. Barneby for information about Nevada *Astragali* and for the preparation of the accompanying plate.

<sup>1</sup> Previous notes in this series have appeared as follows: Madroño 4: 128-130. 1937; Bull. So. Calif. Acad. Sci. 37: 1-11. 1938, 38: 1-7. 1939.

Type specimens of species herein described as new are in the Clokey Herbarium now on deposit at the University of California, Berkeley.

KEY TO THE SPECIES OF *ASTRAGALUS*

I. Perennials

1. *Pods 1-celled*

A. Pods sessile.

Pods leathery.

Pods horizontal, 1.5 cm. or more long; low plants, stems decumbent.

Pods strigose, tapering at base, narrowly lanceolate-linear, decidedly arcuate, 3–4.5 cm. long.

Leaflets elliptic; pubescence appressed, hairs with median attachment; flowers 2–3 cm. long

1. *A. amphiozys*

Leaflets oval to broadly obovate; pubescence loose, somewhat tangled, hairs with terminal attachment

2. *A. Tidestromii*

Pods long villous, obliquely ovoid with up-turned tips.

Corolla purple.

Pubescence of leaflets appressed; calyx tube about 10 mm. long, with nearly white hairs, teeth 2–3 mm. long; pods 1.5–2.5 cm. long

3. *A. Newberryi*

Pubescence of leaflets loosely villous; calyx tube 7–8 mm. long, with mostly black hairs, teeth 4–5 mm. long; pods 3 cm. or more long

3a. *A. Newberryi*  
var. *funereus*

Corolla crimson

4. *A. coccineus*

Pods erect, about 1 cm. long; flowers 7–10 mm. long; stems slender, 3–5 dm. long

5. *A. humistratus*  
var. *sonorae*

Pods membranous, much inflated, speckled; sutures equally convex; leaflets lance-linear to linear

6. *A. aequalis*

B. Pods stipitate.

Pods leathery; stipe from very short to nearly as long as calyx

7. *A. Preussii*

Pods membranous, much inflated, mottled

8. *A. artipes*

2. *Pods completely or incompletely 2-celled*

A. Pods partially 2-celled; septum narrow.

Pods stipitate, somewhat inflated.

Stipe 3–5 mm. long.

Pods leathery, erect, nearly straight; flowers white with purple tips, about 13 mm. long

9. *A. arrectus*  
var. *remotus*

Pods membranous, mottled, strongly arcuate; flowers purple, 18–20 mm. long

10. *A. Beckwithii*  
var. *purpureus*

Stipe very short; pods leathery, filled with pulp when green

11. *A. praelongus*

Pods sessile, leathery, slightly arcuate; flowers purplish, 8–10 mm. long

12. *A. mohavensis*

B. Pods completely 2-celled or with the septum reaching almost to ventral suture, sessile.

Pods papery, much inflated.

Flowers white with purple tips; caespitose perennials, stems less than 1 dm. long; pods mottled, septum formed by protrusions from both sutures; alpine or sub-alpine.

Pods 2-3 cm. long, acuminate ellipsoid . . . . 13. *A. platytropis*

Pods about 1 cm. long, oval, with a slender beak 1-2 mm. long . . . . . 14. *A. kernensis* subsp. *charlestonensis*

Flowers purple; stems erect, more than 3 dm. high; pods about 2 cm. long, rounded ovoid, septum formed by protrusion from dorsal suture only; Larrea or lower Juniper Belt . . . . .

15. *A. lentiginosus* var. *Fremontii*

Pods coriaceous, not inflated.

Plants 1-4 dm. high.

Pods nearly straight.

Pods white shaggy-woolly, 2-2.5 cm. long; flowers white with purple tips, 13-15 mm. long . . . . .

16. *A. Minthorniae*

Pods glabrous, 2.5-3 cm. long; flowers purple tinged, 7-8 mm. long . . . . .

17. *A. bernardinus*

Pods strongly arcuate and strongly reticulate, white strigose; flowers purple, 6-8 mm. long . . . . .

18. *A. hemigyris*

Plants acaulescent or subacaulescent, less than 1 dm. high.

Leaflets 3-7, oblanceolate to obovate; calyx teeth 3-4 mm. long . . . . .

19. *A. calycosus*

Leaflets 5-13, elliptic-oblanceolate; calyx teeth 1-1.5 mm. long . . . . .

20. *A. manicus*

## II. Weak, decumbent annuals; flowers 3-5 mm. long, white or purple; pods sessile

Racemes few-flowered; pods papery, linear, 1.5-2 cm. long.

Pods 2-celled except towards tip.

Keel with a short, rounded porrect beak . . . . . 21. *A. Nuttallianus* var. *trichocarpus*

Keel with an acuminate, porrect beak . . . . . 21a. *A. Nuttallianus* var. *acutirostris*

Pods 1-celled, septum from dorsal suture, if present, a mere line . . . . .

21b. *A. Nuttallianus* var. *imperfectus*

Racemes dense and headlike; pods 2-celled, coriaceous, cross-wrinkled, obliquely ovoid, 3-4 mm. long . . . . .

22. *A. dispersus*

1. *ASTRAGALUS AMPHIOXYs* Gray, Proc. Am. Acad. 13: 366. 1878. *Xylophacos amphioxy*s Rydb. Bull. Torr. Bot. Club 32: 662. 1906.

Texas to southern Nevada, Arizona and northern Chihuahua. Local habitat, occasional in Larrea Belt at about 1000 meters: Cottonwood Springs, Clokey 8496; Wilson's ranch, Maguire 18035. Blooms in April.



2. *Astragalus Tidestromii* (Rydb.), comb. nov. *Xylophacos melanocalyx* Rydb. Bull. Torr. Bot. Club 52: 149. 1925; not *Astragalus melanocalyx* Boiss. Nouv. Mem. Soc. Nat. Hist. Mosc. 12: 59. 1860. *Xylophacos Tidestromii* Rydb. Bull. Torr. Bot. Club 52: 155. 1925. *Astragalus Marcusjonesii* Munz, Leaf. West. Bot. 3: 50. 1941.

Southwestern Utah, southern Nevada, northwestern Arizona and southeastern California. Local habitat, gravelly, brushy soil in Larrea and lower Juniper belts at elevations of 1100 to 1300 meters: Kyle Canyon, in flower, April 26, 1937, *Clokey* 7564; in fruit, May 20, 1937, *Clokey* 7563; Kyle Canyon Fan, *Clokey* 7995, in fruit, May 15, 1936, *Clokey* 8220; Las Vegas to Red Rocks, in flower and fruit, March 31, 1940, *Clokey* 8596; Wilson's ranch, in fruit, May 27, 1919, *Tidestrom* 9661 (type of *Xylophacos Tidestromii*).

*Astragalus Tidestromii* is abundant at a station 3 to 4 miles from Wilson's ranch, the type locality of *A. Tidestromii*, at the same elevation and in a similar environment. Studies in the field and herbarium show that there is considerable variation in the pubescence and in the pods. On the leaflets the pubescence varies from parallel and appressed to kinky and tangled. The hairs are always attached at the end and not in the middle as in *A. amphioxys*. The hairs on the calyx may be white, or white and black mixed. The pods vary from 3 to 4.5 centimeters in length and may be curved from a small arc to over half a semicircle. The seeds are reticulate, speckled with purple, 3.5 to 4 millimeters long by 2 to 2.5 millimeters wide. Both *A. melanocalyx* and *A. Tidestromii* were described originally from limited material. Our material has been compared with isotype specimens of *A. melanocalyx* and the type of *A. Tidestromii*. It is evident that these do not warrant even varietal distinction.

3. *ASTRAGALUS NEWBERRYI* Gray, Proc. Am. Acad. 12: 55. 1876. *Xylophacos Newberryi* Rydb. Bull. Torr. Bot. Club 32: 662. 1906.

Utah and central Nevada south to western New Mexico, Arizona and extreme eastern California. Local habitat, scattered as single plants or small groups in openings on brushy ground in upper Larrea, Juniper and lower Pinyon belts: Clark Canyon, *Clokey* 7168; Charleston Park, *Clokey* 7169; Harris Springs road, *Clokey* 7570; Kyle Canyon, *Clokey* 7569, 8404, 8405; Kyle Canyon Ranger Station, *Train* 2169; Kyle Canyon to Deer Creek, *Clokey* 7571; Lee Canyon, *Clokey* 7171; Trout Creek, *Clokey* 7170; below Wheeler Wells, *Clokey* 7167. Blooms about May 1.

3a. *ASTRAGALUS NEWBERRYI* Gray var. *funereus* (Jones) comb. nov. *A. funereus* Jones, Contr. W. Bot. 12: 11. 1908. *Xylophacos funereus* Rydb. Bull. Torr. Bot. Club 52: 367. 1925. *Astragalus Purshii* Dougl. var. *funereus* Jepson, Fl. Calif. 2: 360. 1936.



Southern Nevada and southeastern California. Local habitat, scattered and rare; openings on gravelly soil in the upper Larrea to the lower Yellow Pine belts: Kyle Canyon, *Clokey 7568*; Kyle Canyon trailer camp, *Train 1677*. Blooms about May 1.

A close relationship to *A. Newberryi* is evident from a study of the pods, and the larger size of both the flowers and pods warrants varietal standing. The pubescence of the calyx consists of both white and black hairs with either predominating.

4. *ASTRAGALUS COCCINEUS* (Parry) Brandg. *Zoe* 2: 72. 1891. *A. Purshii* Dougl. var. *coccineus* Parry, *West. Am. Sci.* 7: 10. 1890. *Xylophacos coccineus* Heller, *Muhl.* 2: 217. 1906.

Colorado and Mohave deserts of California; reported from the Charleston Mountains by Jepson (*Fl. Calif.* 359. 1936). Should be looked for on lower foothills especially on the western side of the range. Blooms in April and May.

5. *ASTRAGALUS HUMISTRATUS* Gray var. *SONORAE* (Gray) Jones, *Contr. W. Bot.* 10: 58. 1902. *A. Sonorae* Gray, *Pl. Wright.* 2: 44. 1853. *Batiophaca Sonorae* Rydb. *N. Am. Fl.* 24: 317. 1929.

New Mexico, southern Nevada, Arizona and Sonora, Mexico. Very local in the Charleston Mountains: ridge above Charleston Park at an elevation of 2330 meters, associated with *Pinus scopulorum*, *P. monophylla* and *Juniperus scopulorum*, *Clokey 8408*.

The vegetative parts of specimens from the Charleston Mountains are near the lower limits in measurements. Blooms in June.

6. *Astragalus aequalis* sp. nov. Herba perennis erecta, e basi ramosa, 3-7 dm. alta; caules striati strigosi; folia 6-12 cm. longa; stipulae liberae anguste triangulares, 2-3 mm. longae; foliola 9-15 (plerumque 11) anguste lineari-lanceolata vel linearia obtusa utrinque strigosa, 12-40 mm. longa, 2-4 mm. lata; racemi axillares, folia subtendentia excedentes; flores 6-12, 10 mm. longi, lutei; calyx strigosus, pilis albis vel nigris, tuba 4-4.5 mm. longa, dentibus subulatis vel anguste triangularibus, 1-1.5 mm. longis; vexillum obovatum, apice emarginata, 12 mm. longum, 9 mm. latum; alae quam vexillo paullo breviores, lamina oblonga, 6 mm. longa, auriculo rotundo, 1 mm. longo; carina alis aequans, lamina 5-6 mm. longa, auriculo basalari brevi instructa; legumen sessile persistens chartaceum multo inflatum uniloculatum ellipticum, 3.5-4 cm. longum, 2 cm. latum, 1-2 cm. diametro, suturis subaequaliter convexis, sutura ventrali sulcata (ca. 1 mm.), albus pubescens stramineum purpureo-maculatum vel purpurascens stramineo-maculatum; semina fusca, 2.5-3 mm. longa, 2 mm. lata.

Perennial, erect, branched from base, 3-7 dm. high; stems striate, strigose; leaves 6-12 cm. long; stipules free, narrowly triangular, 2-3 mm. long; leaflets 9-15 (usually 11), narrowly lance-linear to linear, obtuse, strigose on both sides, 12-40 mm. long, 2-4 mm. wide; racemes axillary, 6-12 flowered, extending

above the subtending leaves; flowers 10 mm. long, yellow; calyx tube 4-4.5 mm. long; teeth subulate to narrowly triangular, one-fourth to one-third the length of the tube, strigose with white or black hairs; banner obovate, slightly notched, 12 by 9 mm.; wings slightly shorter, blade oblong, 6 mm. long, with a rounded auricle 1 mm. long; keel as long as the wings, blade 5-6 mm. long, with a short, rounded, basal auricle; pods sessile, persistent, papery, much inflated, 1-celled, 3.5-4 cm. long, elliptical, cross-section elliptical, 2 cm. wide, 1 cm. deep to rounded, 1.5 cm. in diameter, sutures nearly equally convex, ventral suture sulcate about 1 mm., white-pubescent, straw colored speckled with purple to purplish speckled with straw color; seeds smooth, brown, 2.5-3 mm. long, 2 mm. wide.

Occurs at scattered locations in the Charleston Mountains, Clark County, Nevada: Harris Springs road, associated with *Juniperus utahensis*, elevation 1900 meters, in fruit, June 4, 1937, *Clokey* 7572 (type); Kyle Canyon, with *Pinus scopulorum*, elevation 2180 meters, in flower, May 10, 1936, *Clokey* 7172; elevation 2270 meters, in fruit, July 2, 1936, *Clokey* 7173; Lee Canyon, elevation 2450 meters, June 16, 1939, *Alexander* 791; ridge north of lower Lee Canyon, elevation 2000 meters, in fruit, June 6, 1936, *Clokey* 7174; Willow Creek at 1810 meters, in fruit, June 15, 1937, *Train* 1997.

*Astragalus aequalis* is most closely related to *A. Douglasii* (T. & G.) Gray and *A. Douglasii* var. *Parishii* (Gray) Jones. The three can be distinguished as follows:

Pods attached to a minute boss, falling free from the calyx, dorsal suture much more convex than the nearly straight ventral suture.

Stipules 4 mm. long; leaflets 15-23, elliptic to oblong; calyx tube 3 mm. long; teeth subulate, at least half as long as the tube. West central California, coastal. .... *A. Douglasii*

Stipules 4-5 mm. long; leaflets 11-25, oblong to elliptic-obovate; calyx tube 4 mm. long; teeth deltoid, one fourth to one third as long as the tube. Southern California, west of the deserts ..... *A. Douglasii*  
var. *Parishii*

Pods not attached to a minute boss, falling with the calyx, ventral and dorsal sutures equally convex; stipules about 2 mm. long; leaflets 9-15 (usually 11), narrowly lance-linear to linear, 12-40 mm. long, 2-4 mm. wide; calyx tube 4-4.5 mm. long; teeth subulate, one fourth to one third as long as the tube. Charleston Mountains, Nevada ..... *A. aequalis*

7. *ASTRAGALUS PREUSSII* Gray, Proc. Am. Acad. 6: 222. 1864.

*Phaca Preussii* Rydb. Bull. Torr. Bot. Club 40: 47. 1913.

Central Utah, central Arizona, southern Nevada to southeastern California. Local habitat, sandy or gravelly calcareous soil in the Larrea Belt below 1200 meters: Cottonwood Springs ranch, *Clokey* 8460; Indian Springs, *Clokey* 8406. Blooms in April.

8. *ASTRAGALUS ARTIPES* Gray, Proc. Am. Acad. 13: 370. 1878.

*Phaca artipes* Rydb. Bull. Torr. Bot. Club 32: 664. 1906.



Colorado to Nevada and Arizona. Local habitat, with *Pinus scopulorum* at an elevation of about 2700 meters: Lee Canyon, July 11, 1938, *Train 2141*.

9. *ASTRAGALUS ARRECTUS* Gray var. *REMOTUS* Jones, Rev. Astrag. 162. 1923. *Tium remotum* Rydb. N. Am. Fl. 24: 391. 1929.

From La Madre Mountain to Good Springs, Clark County, Nevada. Local habitat, among limestone and sandstone rocks at elevations from 1100 to 1700 meters: Cottonwood Springs, *Clokey 8407*; Excelsior Canyon, *Clokey 8713*; Mountain Springs, *Clokey 7998*; Rocky Gap Springs, *Clokey 8714*; Wilson's ranch, *Maguire 18041, 18067*. Blooms in April or May.

10. *ASTRAGALUS BECKWITHII* Torr. & Gray var. *PURPUREUS* Jones, Zoe 3: 288. 1893. *Phaca artemisiarum* Rydb. Bull. Torr. Bot. Club 40: 48. 1913. *Phaceomene artemisiarum* Rydb. N. Am. Fl. 24: 388. 1929.

Western Utah, eastern and southern Nevada. Local habitat, widely scattered in dry soil in upper Larrea, Juniper and Pinyon belts at elevations from 1800 to 2450 meters: Charleston Park, *Alexander 590*; Clark Canyon, *Clokey & Anderson 7164, 7165*; Cold Creek, *Clokey 7989, Train 1976*; Cold Creek Spring, *Clokey 7565*; Deer Creek road, *Clokey 7566*; Harris Springs road, *Clokey 8643*; Kyle Canyon trailer camp, *Train 1692*; below Wheeler Wells, *Clokey 7166*. Blooms in May.

11. *ASTRAGALUS PRAELONGUS* Sheldon, Minn. Bot. Stud. 1: 23. 1894. *A. Pattersoni* Gray var. *praelongus* Jones, Contr. W. Bot. 10: 65. 1902. *Jonesiella praelonga* Rydb. N. Am. Fl. 24: 404. 1929.

Southern Nevada and southwestern Utah; reported from the Charleston Mountains by Jones (Rev. Astrag. 156. 1923). Should be looked for on the lower foothills.

12. *ASTRAGALUS MOHAVENSIS* Wats. Proc. Am. Acad. 20: 361. 1885. *Brachyphragma mohavensis* Rydb. N. Am. Fl. 24: 400. 1929.

Mohave Desert, California and Nevada. Local habitat, scattered and scarce; gravelly soil in Juniper Belt at elevations from 1500 to 1800 meters: Harris Springs road, *Clokey 8687*; Kyle Canyon, *Clokey 7990, 7991*. Blooms in May.

13. *ASTRAGALUS PLATYTROPIS* Gray, Proc. Am. Acad. 6: 526. 1865. *Phaca platytropis* Rydb. Mem. N. Y. Bot. Gard. 1: 246. 1900. *Cystium platytrope* Rydb. Bull. Torr. Bot. Club 40: 50. 1913.

Rare on isolated peaks; Beaverhead County, Montana; Tooele County, Utah; Elko, White Pine and Clark counties, Nevada; Sonora Pass, California. Local habitat. Gravelly slopes at or above timberline on Charleston Peak at elevations of 3400 to 3500 meters; associated with *Pinus aristata*: Charleston Peak, *Clokey 5518, 7992, 8001*; southwest slope of Charleston Peak, *Train 2292*. Blooms in late July.

The Charleston Peak plants differ constantly from the typical form in the following characters: stipules 1.5–2 mm. long, leaflets 11–19, calyx teeth 1 mm. or less long. The illustration (plate 42) in "Revision of the North American Species of *Astragalus*" by M. E. Jones is inaccurate in showing the septum extending from the dorsal suture only. The septum is formed by protrusions from both sutures meeting in the center of the pod. The seeds are dark brown and mitten-shaped.

14. *ASTRAGALUS KERNENSIS* Jepson subsp. *charlestonensis* subsp. nov. A specie differt: foliolis 15–19, leguminibus 1 cm. longis.

Caespitose, decumbent perennial; stems 1–1.5 dm. long, slender, strigose; leaves 6 cm. or less long; stipules deltoid, 2 mm. long, strigose; petioles white strigose; leaflets 15–19, well separated, elliptical to narrowly obovate, obtuse, 4–7 mm. long, strigose on the lower face, glabrous on upper; racemes axillary, shorter than the subtending leaves, 2–6 flowered; peduncles slender, 2–3 cm. long; racemes 1 cm. or less long, the inflated pods appearing capitate; flowers white except for the purple tip to the keel, 8–10 mm. long; calyx strigose with white and black hairs; the tube about 3 mm. long; teeth 0.5–1 mm. long; banner 8–10 mm. long, 4–5 mm. wide, nearly erect, entire or minutely notched at apex; wings nearly as long as the banner, blade 5–6 mm. long, 1.5 mm. wide, with reflexed, basal auricle; keel purple tipped, about 7 mm. long; blade 3.5 mm. long, with reflexed basal auricle; pods sessile, papery, strigose, mottled, 1 cm. long, septum formed by protrusions from both sutures, reaching the tip, only the ventral suture sulcate, oval to nearly globular, obtuse at both ends, with a slender beak 1–2 mm. long; seeds about 5, mitten-shaped, 2.3 mm. long, 2 mm. wide.

Known only from Charleston Peak. With *Pinus aristata*, elevation 3200 meters, July 29, 1937, *Clokey 7573* (type); west slope near Trout Creek, elevation 10,000 feet, June 26, 1926, *Jaeger* (Pomona).

The oval to spherical pods, obtuse at both ends with the partition, formed by protrusions from both sutures, reaching the tip, making the pods completely 2-celled, shows relation to *A. kernensis* Jepson not to *A. lentiginosus* Dougl. var. *sierrae* Jones or other forms near *A. lentiginosus*. These all have the partition formed by a septum, from the dorsal suture only, which does not reach the tip.

The subspecies may be separated from the species as follows:

Leaflets 11–15, pods 6–7 mm. long, 8000–8500 ft., Tulare County, California .....	<i>A. kernensis</i>
Leaflets 15–19, pods 1 cm. long, 10,000–10,500 ft., Charleston Peak, Clark County, Nevada .....	<i>A. kernensis</i> subsp. <i>charlestonensis</i>

15. *ASTRAGALUS LENTIGINOSUS* Dougl. var. *FREMONTII* (Gray) Wats. Bot. King Expl. 66. 1871. *A. Fremontii* Gray, in Torr.





PLATE 27. ASTRAGALUS. Figs a-j, *Astragalus aequalis* Clokey: a, pod, dorsal view,  $\times 1$ ; b, pod, lateral view,  $\times 1$ ; c, d, cross sections of pods,  $\times 1$ ; e, flower,  $\times 3$ ; f, banner,  $\times 2$ ; g, wing-petal,  $\times 2$ ; h, keel,  $\times 2$ ; i, seed,  $\times 4$ ; j, leaf,  $\times 1$ . Figs. k-o, *Astragalus kernensis* Jepson var. *charlestonensis* Clokey: k, longitudinal section of pod,  $\times 2$ ; l, transverse section of pod,  $\times 2$ ; m, banner,  $\times 2$ ; n, wing-petal,  $\times 2$ ; o, keel,  $\times 2$ . Figs. p-z, *Astragalus hemigyrys* Clokey: p, raceme and leaf,  $\times 1$ ; q, pod,  $\times 2$ ; r, transverse section of fresh pod,  $\times 5$ ; s, t, cross sections of dry pods,  $\times 5$ ; u, seed,  $\times 4$ ; v, flower,  $\times 2$ ; w, calyx,  $\times 3$ ; x, banner,  $\times 2$ ; y, wing-petal,  $\times 2$ ; z, keel,  $\times 2$ .

Pacif. R. R. Rep. 4: 80. 1857. *Cystium Fremontii* Rydb. N. Am. Fl. 24: 407. 1929.

Southern Utah to the Death Valley region of California, south to Mexico. Local habitat, locally abundant in rocky, brushy ground in the upper Larrea and lower Juniper belts: Kyle Canyon, *Clokey* 7175, 7574, *Train* 1672; mouth of Pine Canyon, *Clokey* 8612; Trout Creek fan, *Clokey & Anderson* 7176; Wilson's ranch, *Maguire* 16596. Blooms about May 1.

16. *ASTRAGALUS MINTHORNIAE* (Rydb.) Jepson, Fl. Calif. 2: 374. 1936. *Hamosa Minthorniae* Rydb. Bull. Torr. Bot. Club 54: 15. 1927.

Southern Nevada to the New York Mountains, California. Local habitat, gravelly flats and slopes in the Juniper Belt at elevations from 1700 to 2200 meters: Clark Canyon, *Clokey & Anderson* 7180; Kyle Canyon, *Clokey* 7177, 7575, *Train* 1686; Mountains Springs, *Clokey* 7997; below Wheeler Wells, *Clokey* 7179. Blooms in May.

17. *ASTRAGALUS BERNARDINUS* Jones, Proc. Calif. Acad. ser. 2, 5: 661. 1895. *Hamosa bernardina* Rydb. Bull. Torr. Bot. Club 54: 19. 1927.

Mohave Desert from the San Bernardino Mountains, California; reported from the Charleston Mountains by Jones (Rev. Astrag. 258. 1923). Should be expected on the lower foothills. Blooms in early spring.

18. *Astragalus hemigyris* sp. nov. Herba perennis humilis frutescens argyreo-canescens; caules numerosi ramosi, 1-4 dm. alti; folia adscendentes, 5-10 cm. longa; stipulae triangulares acuminatae, 2 mm. longae; foliola 7-11, 6-15 mm. longa elliptica, apice obtuso vel retuso; pedunculi et racemi quam foliis subtendentibus paullo longiores; bractae subulatae, 1 mm. longae; pedicelli in fructu reflexi, leguminibus horizontaliter patentibus; flores purpurei, 6-8 mm. longi; calyx strigosus, pilis albis vel nigris, tuba 3 mm. longa, dentibus subulatis, 2 mm. longis; vexillum obovatum; alae quam vexillo 1 mm. breviores, lunatae, apice rotundo, auriculo magno reflexo; carina alis aequans; legumen 2.5-3 cm. longum, 4-5 mm. latum, subsessile deciduum non inflatum valide reticulatum, uniformiter arcuatum, basi acuto, apice acuto in rostro brevi gracili attenuato, stylo curvato persistenti, biloculatum vel subbiloculatum fere ad apicem, septo crasso ex sutura dorsali extendenti, valvis immaturis crassis paullo succulentis, maturis coriaceis, sutura ventrali paullo prominenti, dorsali sulcata; semina compressa ad hilum alte emarginata, 2.5 mm. longa, 1.5 mm. lata.

Low, bushy, silvery-canescent perennial; stems numerous, branched, 1-4 dm. high; leaves ascending, 5-10 cm. long; stipules deltoid-acuminate, about 2 mm. long; leaflets 7-11, 6-15 mm. long, elliptic, obtuse or retuse; peduncles and racemes somewhat longer than the subtending leaves; bracts subulate, 1 mm. long;



flowers purple, 6–8 mm. long; calyx strigose with white and black hairs; tube 3 mm. long; teeth subulate, 2 mm. long; banner obovate; wings 1 mm. shorter than banner, lunate, rounded at tip, with a large reflexed auricle; keel the same length as the wings, rounded above to a blunt tip, with a reflexed, basal auricle; pedicels reflexed in fruit, pods horizontally spreading; pods sessile, deciduous, not inflated, strongly reticulated, uniformly arched to a half circle, acute at both ends, tapering to a short, slender beak surmounted by the curved persistent style, when green, walls thick, somewhat fleshy, cross-section circular, dry walls leathery, cross-section cordate, ventral suture somewhat raised, dorsal suture sulcate, 2-celled or almost so nearly to the tip by a thick-walled open septum from the dorsal suture, 2.5–3 cm. long, 4–5 mm. high; seeds brown, mitten-shaped, 2.5 mm. long, 1.5 mm. wide.

Growing on rock ledges south of Indian Springs in the Larrea Belt, elevation about 1250 meters, April 18, 1939, *Clokey 8409* (type); *Clokey 7996, 8593*.

*Astragalus hemigyris* is most closely related to *A. Layneae* Greene from which it may be separated as follows:

- |   |                     |
|---|---------------------|
| Stipules 7–10 mm. long; leaves near base of plant; leaflets 13–23, 1–1.5 cm. long; flowers white with purple tip, 15–20 mm. long; calyx 5–7 mm. long; pod 3–5 cm. long, 6–7 mm. wide, pilose-canescens with somewhat curly hairs, curvature of pod most pronounced near tip | <i>A. Layneae</i>   |
| Stipules 2 mm. long; leaves throughout length of stem; leaflets 7–11, 6–15 mm. long; flowers purple, 6–8 mm. long; calyx tube 3 mm. long, pods 2.5–3 cm. long, 4–5 mm. wide, strigose with short appressed hairs, curved nearly uniformly throughout                        | <i>A. hemigyris</i> |

Jones (Rev. Astrag. 261. 1923) reports *A. albens* from Indian Springs, Charleston Mountains. No specimens to substantiate this record are in the Jones Herbarium at Pomona College or in the National Herbarium where many of Jones' first sets are deposited. *Astragalus albens* is a local species of the San Bernardino Mountains of California. Rydberg (Bull. Torrey Bot. Club 54: 22. 1927) calls attention to Jones' description of the pods of *A. albens* "arched mostly to a circle, . . . when mature coriaceous, strongly corrugated, 2–3 cm. long, 3 mm. wide and high, flat for about 1 mm. high along the ventral suture and forming a thick wing, etc.' In the type number the pod is only 1.5 cm. long, forming an arch of about one fourth of a circle, neither coriaceous nor corrugated." The type specimen and other collections from and near the type locality fit the original description. Jones' description of the pods of *A. albens* would serve for the pods of *A. hemigyris*. It is believed that there is no justification for including *A. albens* in the flora of the Charleston Mountains.

19. ASTRAGALUS CALYCOSUS Torr. in Wats. Bot. King Expl. 66. 1871. *Hamosa calycosa* Rydb. Bull. Torr. Bot. Club 40: 50. 1913.

Western Wyoming and Idaho south to southern Nevada and eastern California. Local habitat, slopes in Juniper Belt at elevations of 2000 to 2200 meters: ridge along lower Lee Canyon, *Clokey & Bean 7589, Clokey 8002*; below Wheeler Wells, *Clokey 7163*. Blooms in June.

20. *ASTRAGALUS MANCUS* (Rydb.) Wheeler, *Rhodora* 40: 136. 1938. *Hamosa manca* Rydb. Bull. Torr. Bot. Club 54: 17. 1927.

Northeastern to southern Nevada. Local habitat, slopes and hilltops from timberline with *Pinus aristata* at elevations of 3300 meters to 2600 meters with *Pinus scopulorum*: Charleston Peak, *Clokey 5516*; ridge south of Deer Creek, *Clokey 8635*; between Kyle Canyon and Deer Creek, *Clokey 8000, Alexander 792b*; Lee Canyon, *LaRivers & Hancock 514, Clokey 7999, 8681, Train 2073, Alexander 792a*. Blooms in late June or July.

21. *ASTRAGALUS NUTTALLIANUS* DC. var. *TRICHOCARPUS* Torr. & Gray, Fl. N. Am. 1: 334. 1838. *Hamosa austrina* Small, Fl. Southeast. U. S. 618, 1332. 1902.

Colorado to southern California south to Texas and Lower California. Local habitat, rocky ground in the Larrea and lower Pinyon belts at elevations below 1700 meters: Mountain Springs, *Clokey & Anderson 7985*. Blooms about May 1.

21a. *ASTRAGALUS NUTTALLIANUS* DC. var. *ACUTIROSTRIS* (Wats.) Jepson, Fl. Calif. 2: 379. 1936. *Astragalus acutirostris* Wats. Proc. Am. Acad. 20: 360. 1885. *Hamosa acutirostris* Rydb. Bull. Torr. Bot. Club 54: 331. 1927.

West central Nevada to the Sierra Nevada, south to the Colorado Desert, California. Reported from the Charleston Mountains by Jones (Rev. Astrag. 271. 1923). Should be looked for on the lower foothills in the early spring.

21b. *ASTRAGALUS NUTTALLIANUS* DC. var. *IMPERFECTUS* (Rydb.) Barneby, Leaflet West. Bot. 3: 109. 1942. *Hamosa imperfecta* Rydb. Bull. Torr. Bot. Club 54: 329. 1927.

Nevada, Arizona and Lower California. Local habitat, dry, rocky soil in the Larrea Belt: ridge east of Wilson's ranch, elevation 1320 meters, *Clokey 8712*. Blooms about May 1.

22. *ASTRAGALUS DISPERMUS* Gray, Proc. Am. Acad. 13. 365. 1878. *Hesperastragalus dispermus* Heller, Muhlb. 1: 137. 1906. *Astragalus didymocarpus* Hook. & Arn. var. *dispermus* Jepson, Fl. Calif. 2: 376. 1936.

Western Arizona, southern Nevada and California south to Lower California. Reported from the Charleston Mountains by Jones (Rev. Astrag. 285. 1923). Should be expected at the lower elevations. Blooms in March or April.

South Pasadena, California,  
January 19, 1942.



THE TYPE LOCALITY OF POLYSTICHUM LEMMONI  
UNDERWOOD

HAROLD ST. JOHN

By detective methods it is often possible today to locate rather exactly the type locality of species described but not definitely localized by earlier botanists. These notes are written to publish more information on the type locality of *Polystichum Lemmoni* Underwood (Our Native Ferns, ed. 6: 116-117, 1900). The published type locality was "Near Mt. Shasta, California (*Lemmon*)."

This appears to have been a loose usage of the geographic term, as the strikingly distinctive, but rare, fern has not been subsequently rediscovered on Mount Shasta. William B. Cooke (Am. Fern Journ. 29: 109, 1939) in his account of the ferns of Mount Shasta proper, excluded *P. Lemmoni* from the list, concluding that Lemmon's specimen, the type of the species, was probably not collected on Mount Shasta. This is in agreement with the detailed review and discussion of this type locality by Louis C. Wheeler (Am. Fern Journ. 27: 121-126, 1937). The type specimen is in the herbarium of the New York Botanical Garden. Two of the Lemmon collections there were labeled *P. Lemmoni* Underw. by Dr. L. M. Underwood, but neither definitely marked as the type. The first was collected on Mount Eddy, July 12, 1878; the second, near Shasta, California, July 1879. Dr. H. A. Gleason designated the second as the lectotype, since Shasta was the published type locality, and Dr. L. C. Wheeler at one place agreed with this choice. Wheeler discussed and cited the several Lemmon collections in different herbaria and their variously worded data and indicated that the type locality "near Shasta," did not apply to the former valley settlement called Shasta. It is apparent that duplicate collections were distributed by Lemmon with varying statements of the locality data.

The writer, while preparing a biography, has searched far and wide for botanical correspondence with Lemmon. That with C. B. Davenport does not help on this particular fern, but there is evidence in the letters from J. G. Lemmon to Professor D. C. Eaton, preserved in, and kindly made available by, the Stirling Library, Yale University.

"Sierra Valley, Cal.,  
August 26, '79.

"Now for the most astonishing part of your letter—the new *Aspidium*. Is it possible that it is *distinct*? Why it is abundant in a certain valley not 30 miles west of Mt. Shasta, the old stamping ground of hosts of botanists. I will send you full specimens as I have here a fine lot, . . . I was struck by the appearance of the *Aspidium* & gathered a lot of it for it looked such a marked variety. And I fear yet it may prove a *munitum* for some of the fronds are large & approached the type—in appearance.

"Now for 'habitat, soil, moisture, exposure, abundance, scarcity?' etc. It is quite abundant on the side of the little valley at the headwaters of the South Fork of the upper Sacramento & along the south sloping side of Mt. Eddy, arising on the N. side of this valley. Protrudes from under rocks, a vast number of fronds together—more than any *munitum* I ever saw (which took my eye). The soil a dissolved granite, quite moist & loose, the inclination generally to the S. at a steep angle.

"What is very singular is that a grove of the long lost *Pinus Balfouriana* extends over the same ground, two excellent things found in one day! No objection to the name you are kind enough to propose. Nothing so fine as a fern, and such favorites with the ladies!!"

Lemmon later gave details of the occurrence of *Pinus Balfouriana* Jeffrey: "A few trees at an altitude of 7,500 feet forming a dark-green belt on the south flank of one of the eastern spurs of Scott Mt., 20 miles west of Shasta, where Jeffrey detected it in 1852 (rediscovered by the writer, in 1878; only other California localities, a few trees near the headwaters of Kings River, in the Southern Sierra." (2nd. Bienn. Rept. Calif. State Bd. Forestry 1887-88: 71, 1888). Further on (pp. 86-87) Lemmon continues, "Jeffrey noted his discovery, 'Mountains between Shasta and Scott Valley, N. Cal. Lat. 40° 30' to 41° 51'. Elevation 5,000 to 8,000 feet.' . . . But so small are the groves, and so local their position, that they were not detected anew until August of 1878, when the writer, making his headquarters at Sisson, prosecuted a thorough search of the various intricate mountain ranges lying west of Shasta, and forming spurs of the diversified Scott Mountains. I noted the locality for publication in 'Brewer's Botany of California,' as 'on the southern flanks of the Scott range of mountains, forming a dark-green belt, from 5,000 to 8,000 feet altitude, between the light-colored *P. monticola* below and *P. albicaulis* above it.'"

It appears that at first Eaton thought the fern from "near Shasta" to be a new species and he wrote to Lemmon announcing that he would name it *Aspidium Lemmoni* in his honor. One can imagine the intense pleasure this gave to Lemmon, a fern-lover. Then, on further consideration, Eaton decided that it was not a new species but was identical with *Aspidium mohrioides* Bory of Southern Chile and Patagonia. He published this determination (Eaton, D. C., Ferns of N. Am. 2: 128, 1879; 251-254, pl. LXXX, figs. 4-9, 1880, and Torrey Bot. Club, Bull. 6: 360-361, 1879). On page 128 Eaton recounted this, "At first I believed it to be a distinct species, and proposed to name it after its discoverer, a gentleman whose own modesty has been the innocent reason why some Californian fern was not long ago named in his honor."

Wheeler (p. 122) quotes the two indefinite statements of the locality of this rare fern given by Eaton in his "Ferns of North

America," but omits the third and more detailed one (p. 252), viz., "Mr. Lemmon writes that his fern grows in loose and moist granitic soil the root-stocks hidden under rocks, and a great many plants in one cluster. 'It is very abundant on the side of a little valley at the headwaters of the South Fork of the Sacramento, and along the southern sloping side of Mount Eddy, which rises on the northern side of this valley.' "

Several of the Lemmon collections seen by Wheeler were labeled Scott Valley, Siskiyou County, July 23, 1879, and Wheeler concludes (p. 123) that this is the real type locality. The Scott Mountains are a ridge connecting with Mount Eddy and running in a southwesterly direction from it. Only the northwestern slopes are in Siskiyou County. Scott Valley, drained by the Scott River into the Klamath, runs northerly from Scott Mountain and is about sixteen miles westerly of Mount Eddy. The headwaters of the Sacramento on the slopes of Mount Eddy are in Shasta County, about sixteen miles southwesterly of Mount Shasta, so the labels would indicate that Lemmon in 1879 found two localities, one on Mount Eddy collecting there on both July 12, 1878 and July 23, 1879, and one on Scott Mountain. We also have Lemmon's statement that he also found the fern in August, 1878 on the same day that he discovered a grove of *Pinus Balfouriana* on the southern side of Scott Mountain at 7,500 feet altitude. However, it is significant that in the contemporary letters and in the data on specimens furnished at the time to Gray and Eaton, that only the Mount Eddy locality is mentioned.

Wheeler (p. 123) puzzled over a printed label of one specimen indicating apparently that J. G. Lemmon and wife were collectors of a specimen dated 1879. Mr. Lemmon's name was underlined and this would seem to indicate that he alone was the collector. It can now be positively so stated, since J. G. Lemmon and Miss Sara A. Plummer were not married till late November, 1880.

Mr. Lemmon advertised for sale, specimens of "*Aspidium Mohrioides* Bory (New to North America)," on a handbill (Pacific Coast Flowers and Ferns, Distribution of 1880). He again enumerated this rare fern as *Aspidium mohrioides* Bory (Ferns of the Pacific Coast, ed. 1: 12, 1882). He named it the New Shasta Shield Fern, and located it at "Mt. Eddy, Head-waters Sacramento River; near Shasta Cal. 1879. (New Species!)." His insertion of the phrase "New Species" was quaint, to say the least, when he accepted it, upon Eaton's determination, as the old species described by Bory de St.-Vincent. Wheeler (p. 124-125) decided that this listing by Lemmon was based upon two of his own locality records, Mount Eddy, and near Mount Shasta (= Scott Valley), and this is now confirmed.

The writer has two volumes of "American Ferns," quarto sized books bound in blue cloth with the title and ornamental designs



of ferns on both cover and title page. These books have no other printed words, and no indication of author. They have on each page a pressed fern collected by Lemmon, attached by strips and with an herbarium label with data. Each contains a specimen of *Aspidium Mohrioides* Bory and a printed label form with "U. S. Pacific Slope Flora, (California). Coll. by J. G. Lemmon and wife, Oakland, California, 188-." The data is in Mr. Lemmon's handwriting. On one it is "Near Shasta, 8,600 ft. alt. Found elsewhere only in Patagonia and Falkland Is. S. Am. Jul. 1878." On the other it is, "Near Shasta. N. Cal. 'Only found elsewhere in Patagonia.' July 1883." These books were made up by Mr. and Mrs. Lemmon for sale to botanists and fern-lovers. Doubtless many of the ferns found in our public herbaria were supplied in this book form. The two books are not identical in number of species or arrangement. It is not clear just how many times Lemmon revisited his localities in the Shasta region, but he kept dried specimens of this fern in stock and it was one of his most unique and desired collections.

Dr. W. L. Jepson has informed the writer that Lemmon did not keep complete collection number books. None of any sort has survived. The sets of his plants sorted and distributed by Dr. Asa Gray were handled differently, but those issued by Lemmon himself were selected from the duplicate stock, each set individually, when ordered. Real duplicates of a single season's collecting were thus prepared and issued over a period of decades, using whatever labels were then available, and Mr. Lemmon or Mrs. Lemmon inserting the written data (perhaps from memory) with variations in wording inevitable by this method. This doubtless explains the existence of the several apparently different habitats and localities for Lemmon's collections of this one fern in the general vicinity of Mount Shasta.

The lectotype designated by Gleason is "near Shasta, July 1879." This lectotype lacks accurate locality data, especially since it is now known that the species does not occur on Mount Shasta. Later Wheeler (p. 122) more precisely chose the type locality as Scott Valley. He was apparently influenced by the existence of a specimen from Lemmon's own herbarium, now at the University of California, labeled "Scott val. near Shasta, July 23, 1879, J. G. Lemmon." This agreed with the data published by Underwood, "Vicinity of Mount Shasta, Calif." and was a specimen retained by Lemmon. Other factors, however, provide arguments against Wheeler's choice. The type specimen cannot be that in Lemmon's herbarium, but must be one of the two specimens in the New York Botanical Garden labeled as the new species by Underwood himself. The Lemmon herbarium received by the University of California was the remnant left after Mr. and Mrs. Lemmon had eked out a living by selling their specimens. The remaining collections had poor data, many of these specimens

when incorporated in the Berkeley collection could only be labeled "Lemmon Herbarium" as there was no exact statement of data found. In any case, Underwood did not study or cite these particular specimens, rather the ones in New York. It seems well demonstrated that Mount Shasta was intended as the general area and cannot have been the exact locality. Though Lemmon collected this rare fern in Scott Valley, also on the south side of Scott Mountain, and also on the south side of Mount Eddy, the latter is here proposed as the lectotype locality. It is selected because of the detailed locality data supplied contemporarily by Lemmon to D. C. Eaton, and published by Eaton [for *Aspidium mohrioides*], and of Lemmon's own listing of Mount Eddy in his Ferns of the Pacific Coast. These statements are quoted here fully on a previous page.

The exact taxonomic position of this fern continues to trouble the botanists. At first Eaton considered it a distinct species, then on reconsideration determined it as *Aspidium* [= *Polystichum*] *mohrioides* Bory, and later H. Christ agreed. Underwood separated it as a new species, *Polystichum Lemmoni* which was accepted by Piper and by Maxon. Now, Professor Fernald (*Rhodora* 26: 92. 1924) has made the northern plant a variety of the South American one and evaluated its characters. He classifies it as *Polystichum mohrioides* (Bory) Presl var. *Lemmoni* (Underw.) Fernald. The writer has not made a detailed revision of this group, but he recently compared the North American *P. Lemmoni* with good material of *P. mohrioides* from the far extreme of South America, and was struck by their dissimilarity. For the time being he is content to follow Underwood and Maxon, and to accept *Polystichum Lemmoni* Underwood as a species.

University of Hawaii, Honolulu,  
April 14, 1942

## FAR WESTERN NOVELTIES IN SALIX

CARLETON R. BALL

Activities of collectors continue to bring to light hitherto unrecognized variations in willows. Continuing studies of relationships indicate a need for new combinations which better represent actual affinities. This paper contains some novelties in each category.

The abbreviations for herbaria containing specimens cited are as follows: BPI, National Arboretum Herbarium, Bureau of Plant Industry, United States Department of Agriculture; CAS, Herbarium of the California Academy of Sciences; CRB, *Salix* herbarium of Carleton R. Ball; CUA, Herbarium of the Catholic University of America; USN, United States National Herbarium; SU, Herbarium of Stanford University; UC, Herbarium of the University of California.

NEW VARIETIES OF *SALIX PULCHRA* CHAMISSE

*Salix pulchra*, with rather broadly elliptical leaves acute at both ends, is a species of far northwestern North America. It occurs throughout Alaska, except the southeastern portion, and in northwestern British Columbia, most of Yukon Territory, and the lower Mackenzie Valley.

Like many species of *Salix*, it exhibits both broad-leaved and narrow-leaved variations from the normal or average. The Swedish salicologist, Andersson, frequently added varieties *latifolia* and *angustifolia* when describing new species, or reviewing old ones, as in *S. Richardsonii*. The late American salicologist, Bebb, also often described one or both variations, as in *S. laevigata* and *S. glaucophylla*. More recently, Fernald has separated the Labradorean *S. cordifolia* into a series of varieties based on leaf size, shape, and pubescence. Still more recently, Schneider has erected varieties of *S. anglorum*, *S. ovalifolia* and others on leaf width and shape. The writer also has followed this practice in *S. lasiandra*, *S. lutea*, *S. glauca*, *S. reticulata* and other species. Because these variations in *S. pulchra* render difficult its complete recognition from descriptions of the more typical material, it seems desirable to describe as varieties its two chief leaf variations.

*SALIX PULCHRA* Cham. var. *Looffiae* var. nov. E forma typica speciei differt foliis anguste vel late obovatis vel obovato-ovalibus, apice rotundatis vel apiculatis vel terminalibus acutis.

The variety *Looffiae* differs from the species in having its leaf-blades narrowly to broadly obovate, or obovate-oval, rounded to apiculate at apex or the distal leaves acute. Common dimensions in centimeters are:  $1 \times 2-2.5$ ,  $1.5 \times 3-3.5$ ,  $2 \times 3-4$ ,  $2.5 \times 3.5-4$ ,  $3 \times 4$ ,  $2.5-3 \times 5$  and  $3-3.5 \times 6-7$ .

It is a pleasure to name this willow for Ethel H. (Mrs. Henry B.) Loeff of Oak Harbor, Washington, who has collected on Kodiak Island during two seasons. Her critical ecological work has done much to explain the distribution and the peculiar expression of arctic willows on that island.

Specimens referred to this variety are listed below. Most of the plants from coastal areas are recorded as of prostrate or depressed habit, but this is true also of specimens of typical *S. pulchra*. The specimen collected by Setchell appears to have been erect in habit.

SOUTHERN ALASKA. Kodiak Island: Alitak, prostrate, mountain slope, eastern exposure, altitude 500 feet, May 26, 1940, *Ethel H. & Henry B. Loeff 1191* (type, pistillate, CRB, 3 sheets); prostrate, southern exposure, 1198A (CRB, pist.); decumbent, in mixed moss and grass association, altitude 75 m., *W. J. Eyerdam 2047* (CRB, pistillate); no specific locality, *Roland Snodgrass 39* (CRB); altitude 1385-2500 feet, Gulkana to Paxson, *Wm. A. &*



*Clara B. Setchell* 77 (CRB, UC). WESTERN ALASKA. St. Paul Island, Pribilof Islands, August 7, 1891, *C. H. Merriam* (USN); plants browsed by muskoxen, Nunivak Island, *O. J. Murie* 2060 (CRB); St. Matthew Island, *Coville & Kearney* 2086a (USN); St. Lawrence Island, Northeast Cape, *Coville & Kearney* 2001 (USN); King Island, Bering Sea, *J. P. Anderson* 3607A (CRB). NORTH-ERN ALASKA. Walker Lake, Kobuk River, August 21, 1901, *W. C. Mendenhall* (USN); Alatna River, 65 miles above mouth, July 23, 1901, *Mendenhall* (USN); Beaver, Yukon River, *W. A. & C. B. Setchell* 408 (CRB, UC, USN); Circle City, Yukon River, *W. A. & C. B. Setchell* 392 (CRB, UC, USN).

The more vigorous plants, like those from the Yukon River and the Alatna River (tributary of the Koyukuk), have elongated seasonal shoots with broad leaves at the outer end and relatively narrower blades below.

*SALIX PULCHRA* Cham. var. *Palmeri* var. nov. E forma typica speciei differt foliis anguste oblongis vel elliptico-oblongis vel anguste elliptico-oblanco-latis, apice acutis vel acuminatis, 0.8–1.5 cm. latis, 4–6(8) cm. longis.

The variety *Palmeri* differs from the species in having narrowly oblong, elliptic-oblong, or narrowly elliptic-oblanco-late leaf blades, 0.8–1.5 centimeters wide, 4–6 or 8 centimeters long, and acute to acuminate at the apex. Common dimensions in centimeters are:  $0.7 \times 3.5$ ,  $0.8-1 \times 4$ ,  $0.8-1.2 \times 5$ ,  $1-1.3 \times 6$ ,  $1.5 \times 7$ , and  $1-2 \times 8$ .

A form described by Andersson of Sweden requires consideration. In 1858, he published a paper on American willows simultaneously in Sweden (*Oefvers. Kon. Vet.-Akad. Förh.* 15: 100–133) and America (*Proc. Am. Acad. Arts & Sci.* 4: 50–78). In the Swedish paper (p. 123), he described *S. phyllicoides*, believed by Bebb to be *S. pulchra* but by Schneider to be a different Asiatic species, and added: “*latifolia*.” “*angustifolia*,” without description or indication of rank. In the American paper, edited and annotated by Asa Gray, these entities are called forms and described (p. 64). The second reads: “Forma *angustifolia*: foliis 1–2 pollicaribus  $\frac{1}{2}$  poll. latis lanceolatis integerrimis.” Gray doubtless got this information from Andersson. In his *Monographia Salicum*, 1867, Andersson described this form as “*angustifolia*: foliis lanceolato-linearibus, 4–5 pollices longis medio  $\frac{1}{2}$ – $\frac{3}{4}$  poll. latis. . . .” In his treatment of world *Salices* (DC. *Prodromus* 16 fasc. 2: 190–323. 1868), he writes “2, *argentifolia*: foliis lanceolato-linearibus 2–3 poll. longis. . . .” (p. 245).

The name *argentifolia* doubtless was a typographical error but the striking discrepancies in leaf length remain unexplained. No localities or collectors are cited in any paper. Because of this omission, the discrepancies noted, and the uncertain identity of *S. phyllicoides*, Andersson’s form must be disregarded.

The specimens referred to var. *Palmeri* are listed below. The

variety apparently is most common in a belt extending south to north through central Alaska, with an outlier to the west on Norton Sound and to the east on the Arctic Coast of northeastern Yukon Territory. The type (*Palmer 121*) was collected in the Matanuska Valley of south-central Alaska. Another specimen of the type collection is in the herbarium of the Fish and Wildlife Service at the Research Laboratory of the Patuxent Wildlife Refuge near Beltsville, Maryland. It is a pleasure to name this variety for L. J. Palmer of the United States Fish and Wildlife Service at Fairbanks, whose collections of plants browsed by moose and reindeer have done much to increase our knowledge of their distribution, ecology, and taxonomy.

**SOUTH-CENTRAL ALASKA.** Alaska Peninsula, Kukak Bay, *Coville & Kearney 1633* (CRB, USN); Kenai Peninsula, between Skilak and Tustumena lakes (moose-browse reconnaissance), *L. J. Palmer, 1, 6, 22, 32, 36, 56, 66* (CRB); Olga Bay, Kodiak Island, altitude above 1600 feet, *E. H. & H. B. Looff 356* (CRB); mountain shrub type, Matanuska Valley, *Palmer 121* (CRB, type); Richardson Highway, Gulkana to Paxson, *W. A. & C. B. Setchell 81* (CRB, UC); Summit Lake, *W. A. & C. B. Setchell 105* (CRB, UC); Mount McKinley National Park, Savage River Headquarters, altitude 3800–4200 feet, *W. A. & C. B. Setchell 185, 186, 189, 193* (CRB, UC). **WEST-CENTRAL ALASKA.** Norton Sound: Egavik, August 11, 1931, *C. H. Rouse 13, 14* (CRB); Pastolik Reindeer Camp, *Rouse 26* (CRB). **CENTRAL ALASKA.** Vicinity of Fairbanks: Pedro Dome, altitude 2800 feet, August 11, 1909, *R. S. Kellogg* (USN); McKinley Creek, tributary of Forty-mile River, *Murie 141* (USN). Steece Highway, Fairbanks to Circle City, Twelve-mile Summit, altitude 3225 feet, *W. A. & C. B. Setchell 551* (CRB, UC). **YUKON TERRITORY.** Near delta of Mackenzie River, Mackenzie Bay, Shingle Point, 69 north lat., 137 west long., *A. Dutilly 18141* (CUA), *18143, 18144* (CRB, CUA).

#### NEW SPECIFIC AND VARIETAL COMBINATIONS

Following study of more adequate material, it often becomes necessary to elevate varieties to specific rank, to degrade specific entities to varietal rank, or to transfer varieties from one species to another. Changes of all three kinds are made herein.

*Salix Walpoleii* (Coville & Ball) comb. nov. *Salix Farrae Walpoleii* Coville and Ball, Bot. Gaz. 71: 435–436. 1921.

It was a mistake to arrange this northern willow as a variety of the more southern species belonging to Section Cordatae. Further study and more abundant material show that it is most closely related to *S. pyrifolia* Andersson (*S. balsamifera* Barratt), which Schneider separated from the Cordatae and made the basis of a new section, Balsamiferae. Our plant, however, appears to be more properly regarded as a second species in that section than as a variety of *S. pyrifolia*.

The description given at the time of varietal publication still is reasonably adequate. The branchlets are somewhat more pubescent than was then indicated, the distal leaves on vigorous shoots may be subovate and rounded at base, the stipules reach 8 millimeters, and the styles sometimes are 0.4 millimeters long. A comparison of some contrasting characters of *S. pyrifolia* and *S. Walpolei* is given below.

ORGAN	<i>S. pyrifolia</i>	<i>S. Walpolei</i>
Young branchlets	glabrous	more or less pubescent
Blades		
shape	ovate or ovate-lanceolate	elliptical-lanceolate to obovate
base	cordate or rounded	acute or distal roundish
margin	serrulate or crenate-serrulate	entire or remotely crenulate
venation	shallowly rugose	reticulate
Stipules	wanting or minute	2-6 or 8 mm. long
Pistillate aments	3-8 cm. long	2-5 or 6 cm. long
Capsules	7-9 mm. long	5-7 mm. long
Pedicels	2.5-3.5 mm. long	1.0-1.5 mm. long

The known range of this plant has been greatly extended since 1921. The nine specimens then listed were all from north-west Alaska and ranged in location from Seward Peninsula at Bering Strait to the Dall River north of the Yukon River, at about 150 west longitude. More recent collections have extended its recorded range far to the south and east, as shown below.

WEST-CENTRAL ALASKA. Seward Peninsula and adjacent Yukon Valley: Seward Peninsula, 1900, *A. J. Collier* (USN); vicinity of Port Clarence: north side, and east end of Grantley Harbor, *F. A. Walpole 1594* (USN); rocky banks, northwest shore of Imunik Basin, July 30, 1901, *Walpole 1624* (CRB, photo; USN, pistillate type); banks of Tuksuk Channel, August 5, 1901, *Walpole 1742* (CRB, USN staminate type); Cape Nome, summer 1900, *F. E. Blaisdell* (USN); gravelly bluff near road, Hastings Creek, *C. W. Thornton 614* (USN); near Nome, *Thornton 630* (CRB, USN); tundra, Nome, *George N. Jones 9043B* (CRB). Kaltag, Yukon River east of Norton Sound: bank of Yukon River, *Rouse 45* (CRB); water's edge, *W. A. & C. B. Setchell 457-459* (CRB, UC). NORTH-CENTRAL ALASKA. Valley of Kobuk River, near camp, August 20, 1901, *W. C. Mendenhall* (USN); Valley of Alaskuk River, 30 miles above mouth, July 21, 1901, *Mendenhall* (USN); Valley of Alaskuk (Alatna?) River, along Help-me-Jack Creek, near camp, July 26, 1901, *Mendenhall* (USN); Dall River, 75 miles above mouth, June 25, 1901, *Mendenhall* (USN, 2 sheets); Wiseman, middle fork of Koyukuk River, *J. P. Anderson & G. W. Gasser 5815* (CRB). EAST-CENTRAL ALASKA. Steece Highway, Fairbanks to Circle City: creek near Twelve-Mile Roadhouse, altitude 2450 feet, *W. A. & C. B. Setchell 530, 534b* (CRB, UC); Faith Creek, some distance below Twelve-Mile Summit, to Cleary Summit, altitude 2600-2700 feet, *W. A. & C. B.*



*Setchell 555, 561* (CRB, UC); Twelve-Mile Roadhouse, *Anderson 2433* (CRB). Mt. McKinley National Park: Igloo Camp, altitude 2600 feet, *W. A. & C. B. Setchell 173* (CRB, UC); stream banks near Park Headquarters, *Aven Nelson 3595, 3604* (CRB); Cantwell, southeast corner of Park, *Nelson 4215* (CRB). Richardson Highway: Rapids Roadhouse, altitude 2130 feet, *W. A. & C. B. Setchell 110, 120* (CRB, UC); altitude 2700–3000 feet, *Paxson, W. A. & C. B. Setchell 87, 90, 95* (CRB, UC). MACKENZIE, NORTH-WEST TERRITORY. Alkavik, 68 deg., 13 min. north lat., 135 deg. west long. *A. Dutilly 18054* (CRB, CUA), 18055 (CUA); the common willow of alluvial ridges, Mackenzie Delta, Pete's Creek, east side of Richards Island, between 69 and 70 deg. north lat., *J. J. Lynch & C. E. Gilliam 1605* (Herbarium of United States Fish and Wildlife Service).

*SALIX HINDSIANA* Benth. var. *leucodendroides* (Rowlee) comb. nov. *Salix macrostachya leucodendroides* Rowlee, Bull. Torr. Bot. Club 27: 250, pl. 9, fig. 6 (doubtfully representing this variety). 1900; Abrams, Fl. Los Angeles 102. 1904 (at least in part); *ibid.*, Suppl. ed. 102. 1911. *S. argophylla* Nutt. *sensu* Rowlee, Bull. Torr. Bot. Club 27: 251, pl. 9, fig. 7. 1900 (in part); Abrams, *ibid.* 102. 1904 (probably in part); Jepson, Man. Fl. Pl. Calif. 264. 1923 (in part), not of Nuttall. *S. exigua virens* Rowlee, Bull. Torr. Bot. Club 27: 255. 1900 (in part). *S. integrifolia leucodendroides* Rowlee, Bull. Torr. Bot. Club 27: 250. 1900 (*nomen nudum*). *S. longifolia* Muhl. *sensu* Parish, Zoe 4: 347. 1894 (in part, as indicated by localities), not of Muhlenberg. *S. longifolia argyrophylla* Anders. *sensu* Jepson, Mem. Univ. Calif. 2: 178. 1910 (in part), not of Andersson. *S. sessilifolia* Nutt. *sensu* Britton and Shafer, No. Amer. Trees, 156. 1908 (in part); Jepson, Mem. Univ. Calif. 2: 178. 1910 (in part), not of Nuttall. *S. sessilifolia leucodendroides* (Rowlee) Schneider, Bot. Gaz. 65: 26. 1918, *ibid.* 67: 319–322. 1919 (synonymy, discussion and citation of specimens), Jour. Arn. Arb. 3: 64, 86 (and pages cited for *S. sessilifolia*). 1922; Ball in Abrams, Illus. Fl. Pac. States 1: 491 (discussed under *S. Hindsiana* Bentham). 1923; Jepson, Man. Fl. Pl. Calif. 264. 1923.

The variety *leucodendroides* differs from the species in having longer, relatively narrower, more pointed, and always remotely denticulate leaves, usually less densely pilose capsules and flower scales, and less evident styles.

Seasonal shoots usually densely white-pubescent, older branchlets less so; blades linear to linear-elliptical, 5–8 cm. long and 4–7 mm. wide or, on vigorous shoots, 9–10.5 cm. long and 6–8 or 9 mm. wide, common sizes, 4 × 0.5, 5 × 0.4–0.5, 6 × 0.4–0.6, 7 × 0.5–0.7, 8 × 0.5–0.7, 9–10 × 0.6–0.8 cm., short-acuminate at apex, tapering at base into a short petiole, always remotely denticulate, especially on the outer half, the teeth sometimes subspinulose, densely pilose-pubescent and usually silvery when

young, becoming more thinly clad by expansion, and frequently becoming more or less glabrate and greenish with age (and then often referred to *S. exigua virens* Rowlee); aments coetaneous, leafy-peduncled, solitary or 2-4 together; peduncles 1-5 cm. long in flower, the pistillate up to 8 cm. long in fruit; staminate aments 1 or usually 2-3, or occasionally 4, on one peduncle; pistillate aments 1 or 2 together, 2.5-4 or sometimes 5-6 cm. long; capsules lanceolate, 5-5.5 or 6 mm. long, closely sessile or occasionally very short-pedicelled, densely to thinly pilose, often becoming glabrate and brownish in age; styles scarcely evident or 0.1-0.3 cm. long; stigmas 0.5-0.7 mm. long, divided and reflexed.

For convenience, the brief description and discussion given by Rowlee for his new variety are quoted here.

"One to three meters high, wood soft: leaves much larger, 10-12 cm. long, 1 cm. wide, densely white tomentose on both sides, largest remotely denticulate: aments larger, cylindrical, 4-5 cm. long, otherwise as in the type."

"*S. integrifolia* var. *leucodendroides* is a very striking form from southern California collected by Mr. S. B. Parish, nos. 2134, 2040, and 640. There does not seem to be enough difference to warrant its separation as a species although intergrading forms are wanting."

The above description and discussion of variety *leucodendroides* leave much to be desired. First, Rowlee redescribed the common California long-leaf willow, *Salix Hindsiana* Benthams, under the name *S. macrostachya* Nuttall, a plant of the Columbia River Valley, and cited several California specimens. Then he asserted that, from the description, Benthams's California plant is the same as *S. argophylla* Nuttall, another plant from the Columbia Valley. The facts are that *S. macrostachya* is a synonym of *S. argophylla* and that *S. Hindsiana* Benthams is a good species, confined to California and adjacent Oregon and much more closely related to *S. sessilifolia* Nuttall, of Oregon and Washington, than to *S. argophylla*. Finally, the leaf size given by Rowlee is much larger than the average and denticulation is not confined to the larger leaves but is universal. The result was to confuse readers as to the characters and relationships of his variety. As the plant Rowlee held to be *S. macrostachya* really is *S. Hindsiana* Benthams, the present combination merely accomplishes what Rowlee thought he was doing.

His reference to a species, *S. integrifolia*, in the discussion above, is wholly without meaning. It seems probable that Rowlee contemplated renaming Benthams's plant, which has entire leaves, but later decided it was Nuttall's *S. macrostachya*.

Rowlee obviously did not designate a type, although he cited three collections by Parish (see above). The writer has seen a specimen of number 2040 in the herbarium of the University of California (sheet 55027). On the label, the word "Type" has

been written in Rowlee's own hand. There are two specimens of number 640 in the United States National Herbarium (sheets 780021, 940755). They are var. *leucodendroides* but there is no evidence that Rowlee ever saw them.

Variety *leucodendroides* occurs sparingly in at least five counties in the Coast Range and central basin of California north of the Tehachapi, where the species is common. It occurs more abundantly in all of the counties south of this divide, where the species is much less common. Several specimens from Humboldt County, in the northwestern part of the state, have been referred to this variety but they need further study and are not cited here.

In the western part of southern California this variety is the dominant representative of section Longifoliae, the long-leaf or sandbar willows. To the eastward it gradually is replaced by varieties of *Salix exigua* Nuttall. In the northern edge of its southern range it overlaps the range of the species. On the south it extends into Lower California and on the east into the edge of Arizona. Its altitudinal range is from approximately sea level along the Colorado River and the southern coast to elevations of approximately five thousand feet in the southern mountains.

Because specimens of variety *leucodendroides* are seldom correctly identified, but usually are found under such names as *argophylla*, *argyrophylla*, *exigua*, *Hindsiana*, *longifolia*, *macrostachya*, and *sessilifolia*, it is desirable to cite the numerous specimens which have been referred to it by the writer:

CALIFORNIA (counties from north to south). SANTA CLARA COUNTY. Upper east fork, Coyote Creek, *W. R. Dudley* 4207 (CAS). SAN BENITO COUNTY. Creek east of Lookout Mountain, altitude 3300 feet, *Hall* 9926 (USN); The Pinnacles, *Eastwood* 6750 (CAS); San Juan, *Elmer* 4908 (CAS, USN). MONTEREY COUNTY. Nacimiento River, *Brewer* 544 (USN). TULARE COUNTY. Kern River, Peppermint Valley, altitude 4800 feet, *Dudley* 779 (SU); Three Rivers, near Britton's, June 15, 1902, *Dudley* (SU). KERN COUNTY. Bakersfield, *Piper* 6406 (USN), *E. A. McGregor* 13 (SU); Santa Fe Railroad, west of Bakersfield, *Heller* 7591 (SU, 2 sheets; UC). VENTURA COUNTY. Santa Ynez Mountains: Matilija Canyon, 6.5 km. below Matilija Hot Springs, altitude 270–300 meters, *Fosberg* 7423, 7425 (CRB, 2 sheets each; USN, UC); Matilija Canyon, Ojai Valley, altitude 270 meters, *Mrs. H. P. Bracelin* 633–636 (CRB, 3 sheets of each; USN, UC); Shady (?) Canyon near Ojai, altitude 600 feet, May 22, 1866, *S. F. Peckham*; Sespe, *F. W. Hubby* 134, 135 (label reads "Santa Barbara Co.") (SU); Sespe Canyon, September, 1914, *B. W. Everman* (CAS); Piru Creek, 10 miles above Piru, *Ralph Hoffman* 354 (CRB); Piru Creek, 5 km. above Piru, altitude 270 meters, Santa Barbara National Forest, *Fosberg* 7426 (CRB, 4 sheets; USN, 3 sheets); east of Piru, altitude 180 meters, *Bracelin* 629 (CRB, 2 sheets), 630, 631 (CRB, 2 and 3 sheets; USN, UC); Hueneme, April 7, 1902,



*Burt-Davy* (UC); Oxnard, Patterson Ranch, *Burt-Davy* 7630 (UC); delta plain, Santa Clara River, *Hoffman* 181 (CRB); Ventura, along beach, *Eastwood* 5034, 5035 (CAS). LOS ANGELES COUNTY. San Gabriel or Sierra Madre Mountains and their southern foothills: Arraster, altitude 2750 feet, May 10, 1919, *F. W. Peirson* (CRB); Castaic Creek, below Castaic, *Fosberg* 7411, 7413 (CRB, USN, UC); Gorman, *C. R. & B. S. Ball* 2526 (CRB, 3 sheets; USN, UC); Saugus, *Elmer* 3650 (USN); Burbank, 1904, *J. C. Nevin* (SU). San Gabriel Mountains: canyons of Sierra Madre Mountains, May, 1888, *Hasse* (USN); Little Tujunga Canyon (near Burbank), *P. Parney* 233 (CAS); San Gabriel Wash, altitude 700 feet, March 6, 1921, *Peirson* (CRB); Tujunga Canyon, altitude 1300 feet, March 30, 1919, *Peirson* (CRB); Tujunga Wash, Stonehurst, San Fernando Valley, *Fay A. MacFadden* 11047 (CRB); Verdugo Hills, La Tuna Canyon, *MacFadden* 3069 (SU, UC), 11044 (CRB); west fork of Garapito Creek, altitude 1150 feet, *Ewan* 4219 (CRB); Puddingstone Canyon, San Jose Hills, *Wheeler* 1723A, 1723B (CRB). Santa Monica Mountains: between Calabasas and Agoura, *Fosberg* 5850 (CAS, CRB, 3 sheets; USN, SU, UC, 3 sheets). Los Angeles and vicinity: Elysian Park, *George B. Grant* 2294 (SU), 1156 (UC); Los Angeles River bottom, June, 1888, *Hasse* (USN), September 9, 1917, *F. Grinnell, Jr.* (SU); El Monte, altitude 300 feet, *Johnston* 1242 (SU); Englewood, *Abrams* 1493 (SU, 2 sheets). Mohave Desert: Lovejoy Dam, Lovejoy Buttes, *Peirson* 9859 (CRB). SAN BERNARDINO COUNTY. Mojave Desert: Cushenberry Canyon, *Parish* 4931 (SU, on sheet 51351 with *S. exigua*); 1.5 miles north of Victorville, altitude 815 meters, *Bracelin* 597, 598 (CRB, 2 sheets, USN, UC); Helendale (Judson), Mojave River, *Bracelin* 591 (CRB), 592 (CRB, USN); Hesperia, Mojave River bed, *G. I. Moxley* 950 (USN). San Bernardino Mountains and foothills: Waterman Canyon, *Shaw & Illingsworth* 4 (SU); mouth of Waterman Canyon, altitude 1500 feet, *Parish* 11401 (UC); borders of streams, altitude 1200 feet, *Parish* 11763 (UC); Keenbrook, Cajon Pass, *Parish* 4930 (SU); Cajon Pass, *Abrams & McGregor* 694 (SU). San Gabriel Mountains: Cucamonga Canyon, altitude 3000 feet, *Johnston* 1241 (SU); Red Hill near Upland, *Johnston* 1243 (SU). San Antonio Mountains: Prairie Fork of San Gabriel River, altitude 5000 feet, *Johnston* 1685 (SU). San Bernardino and vicinity: San Bernardino, *P. B. Kennedy* 1673 (CAS). *Marian L. Campbell* 45, 46 (CAS); altitude 1000-2500 feet, *Parish* 4591, 4592 (SU); Santa Ana River, altitude 1000 feet, *Parish* 4786, 4787 (USN, SU), 5197 (SU), *Alfred Rehder* 158 (CAS); San Bernardino Valley, *S. B. & W. F. Parish* 640 (USN, 2 sheets; this number cited by Rowlee), altitude 300 meters, *Parish* 11134 (UC); Colton, May 20, 1882, *M. E. Jones* (CAS, CRB, UC); Chemehuevis Valley, *Jepson* 5208 (SU). ORANGE COUNTY. Los Alamitos: July 20, 1908, *I. J. Condit* (UC, 2 sheets); Bixby Avenue, west of Hansen

Road, *C. R. Wolf* 3843, 3845 (CRB, USN, UC). Santa Ana River: Santa Ana, *Helen D. Geis* 553, 554 (SU); Santa Ana Canyon, altitude 500 feet, *J. T. Howell* 2440 (CAS, 2 sheets), altitude 120 meters, *Wolf* 2953, 2954 (CRB, USN, UC). RIVERSIDE COUNTY. Riverside and vicinity: Santa Ana River near Riverside, May 20, 1888, *Parish* 2040 (type?) (UC). *H. DeForest* 3 (CRB); Santa Ana River near Corona, *Crawford and Johnston* 1244 (SU); Santa Ana River, altitude 500 feet, *Peirson* 4282 (CRB); Santa Ana River, 4.8 km. north of Arlington, altitude 240 meters, *Bracelin* 599, 602, 604 (CRB, USN, UC), 605, 606 (CRB, 2 sheets each). San Jacinto, June, 1921, *Ethel H. Campbell* (CAS); San Jacinto Mountains, east base, along borders of Colorado Desert, *Hall* 2105 (SU, UC); San Jacinto Valley, June, 1897, *George F. Reinhardt* (UC); San Jacinto River Canyon, Oak Lodge, altitude 3000 feet, *Parish* 11702 (UC). Colorado Desert. Thousand-Palm Canyon, *DeForest* 2 (CRB). SAN DIEGO COUNTY. Mountain Spring (International Boundary Commission, United States and Mexico), *Edgar A. Mearns* 3040 (USN, SU); near Tia Juana River, Tia Juana, August, 1902, *A. C. Herre* (SU), *Abrams* 3485 (SU); near Tia Juana, June, 1895, *S. G. Stokes* (SU); San Diego River, San Diego, *Abrams* 3419 (SU); Old Town, *Bracelin* 620-623, 625-628 (CRB, 1 to 3 sheets each; USN, except last 3; UC); flats of San Luis Rey River, west of the Mission, *Wiggins* 3034 (SU; UC, 2 sheets); Jacumba Valley, *Abrams* 3679 (SU); Laguna Mountains, *Eastwood* 9253 (CAS); Lakeside, *Grant* 6860 (SU); Oneonta, altitude 25 (?) feet, *H. P. Chandler* 5116 (SU); Warner's Hot Springs, *Eastwood* 2822 (CAS). Imperial County. Colorado River bottoms, 10 miles from Yuma, Arizona, *Roxana S. Ferris* 1030 (SU, 2 sheets).

MEXICO. Baja California, near Tia Juana, *M. E. Jones* 3730 (CAS).

*SALIX HINDSIANA* var. *Parishiana* (Rowlee) comb. nov. *Salix Parishiana* Rowlee, Bull. Torr. Bot. Club 27: 249, pl. 9, fig. 3. 1900; *Abrams*, Fl. Los Angeles, suppl. ed., 101. 1911; *Schneider*, Bot. Gaz. 67: 323-325. 1919, Jour. Arnold Arb. 3: 65, 92, 98. 1921; Ball in *Abrams*, Illus. Fl. Pac. States 1: 492, fig. 1198. 1923. *S. exigua* var. *Parishiana* (Rowlee) Jepson, Man. Fl. Pl. Calif., 264. 1923.

Rowlee drew a fairly adequate description of his new species, *Salix Parishiana*, when it is considered that the foliage and aments of the type were not yet fully developed. For convenience of discussion and comparison it is reproduced here:

"A slender shrub, one to three meters high, bark grayish or brown, young twigs cinereous strigose: leaves linear-lanceolate, minutely and remotely denticulate, 5-7 cm. long by 3 mm. wide, silky canescent when young, glabrous and somewhat coriaceous when mature, veins few but very prominent: stipules none: aments on long leafy peduncles, appearing about April 1, 2-3 cm.

long by 1-2 (*sic*) cm. peduncles often 10 cm. long, the upper leaves of the branch much surpassing the ament: ament densely flowered, scales white densely villous all over, oblong, acute: filaments scanty (*sic*) hairy at the base: capsules densely villous, oblong, closely sessile: style distinct: stigmas linear, three times as long as thick.

"A very peculiar form, differing from *S. taxifolia* by its larger leaves and cylindrical aments and quite distinct from other species with linear stigmas.

"CALIFORNIA: Matilija Cañon, San Bernardino Co. (F. W. Hubby (*sic*), nos. 54, 55), Springs Valley, Inyo Co. (F. V. Coville and F. Funston, no. 263)."

Had Rowlee studied the more mature material, with the consequent larger and more evidently denticulate leaves and larger aments, he scarcely would have compared his species with *S. taxifolia* alone. Nor would he have stated so positively that it was "quite distinct from other species with linear stigmas." The type, as so frequently is the case, represents an extreme form of the entity.

Certain characters assigned by Rowlee, such as the glabrousness, linear-lanceolate shape, and veininess of the mature leaves, must have been observed in the collection by Coville and Funston from Inyo County (no. 263), as they are not exhibited by the type specimens. Number 263 probably is a desert form of *S. exigua*, as suggested by Schneider, who in turn considered *S. Parishiana* probably to be intermediate between *S. exigua* as it occurs in southern California and *S. sessilifolia* var. *leucodendroides*.

Through the courtesy of Dr. A. J. Eames and the late Dr. K. M. Wiegand, the types of *Salix Parishiana* Rowlee were made available to the writer from the herbarium of Cornell University. Both types, male and female, are mounted on one sheet. The label reads as follows: "S. longifolia, var. argyrophylla And., Pistillate fl., Cliff Glen; staminate fl., Ojai Hot Spgs., Matilija Cañon, Sta. Barbara Co., F. W. Hubby, No. 54, April 3, 1896." In the upper right corner are pencilled the words: "S. parishiana n. sp. W. W. R.". A second sheet bears a single more nearly mature pistillate specimen and a label reading: "Salix longifolia var. argyrophylla as to leaf characters; S. sessilifolia var. hindsiana as to style and stigma. Matilija Cañon, Kennedy's, Sta. Barbara Co., F. W. Hubby, No. 55, April 19, 1896." It has the same pencilled annotation as the first label, and both annotations are in Rowlee's handwriting. The first cited collection by Hubby (no. 54) consists of a male (type) shoot 38 centimeters long with a half dozen aments, and a female (type) shoot 30 centimeters long with some five aments. The second cited collection by Hubby (no. 55) is a single pistillate shoot about 24 centimeters long, with two aments. On each of the herbarium sheets is the inked annotation "S. parishiana n. sp., WWR." in Rowlee's hand.



From these three specimens, all from Matilija Cañon, and all annotated by Rowlee and cited with his original description, it is possible to give the following emended description.

Aspect gray or silvery-gray; seasonal branchlets puberulent to pubescent, those of the first year glabrate to puberulent; leaves subpetiolate, exstipulate, blades linear (not linear-lanceolate), 4–7 or 8 cm. long, 2–3.5 mm. wide, common sizes  $5 \times 2.5$ ,  $6 \times 2.5$ – $3.5$ ,  $7 \times 2$ – $3$ ,  $8 \times 3.5$ , acute at base and apex, margins somewhat revolute, remotely and minutely denticulate, the midrib and primary veins slightly raised (not 'very prominent') on the gray to silvery puberulent upper surface, the lower surface silvery pubescent (leaves immature and therefore not 'glabrous and coriaceous when mature'); pistillate peduncle 2–3 cm. long in flower to 4 cm. long in fruit, the staminate 7–10 cm. long in flower, each bearing 8–10 foliage leaves; pistillate aments 2 cm. long in flower, 3 cm. long, 1 cm. wide in fruit (not '1–2 cm. '); capsule (no. 55, nearly mature) narrowly lanceolate (not 'oblong'), 4.5–5 mm. long, sessile, pilose, style evident but very short, 0.1–0.2 mm. long, stigmas linear-oblong, 0.5–0.6 mm. long, divided, spreading; flower scales broadly elliptical or elliptical-oblong, 2–2.5 mm. long, thinly pilose-pubescent or subglabrate on the outside, more pilose-pubescent within (not 'densely villous all over'); staminate aments about 2 cm. long and 0.5 cm. wide; stamens two, filaments free or united only at the extreme base, pilose with crinkly hairs on the lower half or two-thirds; ament scales as in the pistillate ament.

Variety *Parishiana* apparently is confined to the southern coastal district of California and occurs chiefly in the mountains from relatively low elevations to five thousand feet above sea level. Present material indicates a range from the Pinnacles in San Benito County to San Diego County at the international boundary. Specimens of the variety are found in herbaria under the names of various species of section *Longifoliae*, as *argophylla*, *exigua*, *Hindsiana*, *longifolia*, *macrostachya*, *sessilifolia* and their varieties.

CALIFORNIA. SAN BENITO COUNTY. Stream bank, Pinnacles, J. T. Howell 4620 (CAS); Bear Valley, Pinnacles, Chester Dudley 6 (CAS). VENTURA COUNTY. (Matilija Canyon is a tributary of the Ventura River, whereas all other streams mentioned are part of the Santa Clara River system.) Matilija Canyon, Cliff Glen (male type), Ojai Hot Springs (female type), April 3, 1896, F. W. Hubby 54; Kennedy's, April 19, 1896, Hubby 55 (types, Cornell University; photographs, CRB, UC); Matilija Canyon, 6.5 km. below Matilija Hot Springs, Santa Ynez Mountains, altitude 270–300 meters, Fosberg 7424 (CRB, 2 sheets; USN, UC); Sespe Creek (between Sulphur and Pine mountains), near Ten-Sycamore Flat, altitude 2300–2500 feet, Abrams & McGregor 169 (SU, male and female; leaves 5–7 cm.  $\times$  3–4 mm., style 0.2–0.4 mm. long, stigmas

1 mm. long); Mount Pinos (near center of northern boundary of Ventura County, its eastern flank drained by Lockwood Creek, a tributary of Piru Creek); Lockwood Creek, below Snedden's, *Dudley & Lamb 4632* (SU, bearing cone galls); Goodenough Meadow, *Dudley & Lamb 4717* (SU, leaves on fruiting branchlet 4-7.5 cm.  $\times$  2-3.5 mm., style 0.1-0.2 mm. long; UC, "near Lockwood Valley Schoolhouse, June 26"); Lockwood Creek, June 5, 1930, *Hoffman* (CAS); Seymour Creek, altitude 5300 feet, *Hall 6343* (UC); 3.2 km. east of Piru, altitude 180 m., *Bracelin 632* (CRB, 2 sheets; USN, UC). LOS ANGELES COUNTY. San Francisco Canyon, *Parish 1984* (UC); San Antonio Mountains, Prairie Fork of San Gabriel River, altitude 5000 feet, *Johnston 1685* (UC, sterile, leaves shorter and broader than normal); near Camp Rock Creek, Pinyon Ridge, San Gabriel Mountains, altitude 4500 feet, *Peirson 716* (CRB). ORANGE COUNTY. Los Alamitos, July 20, 1908, *Condit* (UC). SAN DIEGO COUNTY. Tia Juana, *Eastwood 2926* (CAS).

United States Department of Agriculture,  
Washington, D. C., October, 1941.

## NOTES AND NEWS

The members of the University of California Expedition to El Salvador, under the capable and energetic leadership of Dr. R. A. Stirton of the Department of Paleontology, returned to the United States on May 25, 1942 after nearly six months of successful work in El Salvador. The party was hospitably and graciously received wherever it went. Two men, in particular, were of constant and invaluable assistance,—Dr. Mario Lewy of the Department of Agriculture of El Salvador and Mr. G. A. Swanquist of San Miguel.

The personnel was as follows: Mr. John Davis, herpetologist; Mr. William K. Gealey, geologist; Mr. Nathan Geer, cook and assistant paleontologist; Mr. Milton Hildebrand, mammalogist; Mr. Joe T. Marshall, ornithologist; Dr. R. A. Stirton, paleontologist; and Mr. John M. Tucker, botanist, representing the Herbarium of the University of California.

## PROCEEDINGS OF THE CALIFORNIA BOTANICAL SOCIETY

February 21, 1942. The annual dinner meeting of the Society was held at the Berkeley Women's City Club on Saturday evening. About fifty members and guests were present. Dr. Alva R. Davis, President, acted as toastmaster and introduced with felicity the speaker of the evening, the distinguished mycologist, Dr. A. H. Reginald Buller, Professor Emeritus of Botany, University of Manitoba, and Hitchcock Professor, University of California, 1942. Dr. Buller discussed the ink fungi—species of the distinc-



tive genus *Coprinus* (Pers.) Fr.—and their organization, in a lucid and thoroughly interesting manner. The lecture was abundantly illustrated by slides from excellent field photographs and from Dr. Buller's drawings. The arrangements for the dinner were made by Dr. G. Ledyard Stebbins, Jr., Chairman of the Program Committee. The unique mycological table decorations were collected and arranged by Miss Beryl Schreiber, Mrs. Vera Miller, and Mrs. Lincoln Constance. Relatively few members living at a distance from Berkeley attended the banquet. The existing state of war and the consequent danger and inconvenience of possible "blackouts" are known to have lowered attendance.

March 19, 1942. Speaker: Mr. M. W. Talbot, California Forest and Range Experiment Station. Subject: Guayule and other western American rubber plants. The speaker lucidly described the Government's guayule (*Parthenium argentatum*) plantation project now being developed in the Salinas Valley. The first objective of the project is to prepare a 700-acre nursery, and to plant all available seed of selected high-yielding guayule strains. When cut at a normally economic age the best strains of guayule yield from 1200 to 2000 pounds of rubber per acre. It is expected that in two years the present program will lead to production of some 56,000 tons of rubber, and a great amount of seed of selected strains. Even before the supply of *Hevea* plantation rubber was largely cut off, guayule rubber was approaching normal economy. Following the talk a lively discussion developed with Mr. Talbot, Dr. Fred E. Foxworthy, retired Malayan forester; Dr. Trumbull of the Goodrich Rubber Company; Dr. D. T. MacDougall of Carnegie Institution of Washington, Dr. A. R. Davis, and others participating. The meeting was attended by about ninety members and guests.

April 16, 1942. The "Annual Living Plant and Specimens Meeting" was held under the direction of Dr. G. Ledyard Stebbins, Jr. Prior to the presentation and inspection of specimens, Dr. A. R. Davis presided over a short business meeting. Many interesting native and exotic plants and plant specimens were exhibited and described by a score or so of the Society's members, including Dr. G. L. Stebbins, Jr., Miss E. E. Morse, Prof. W. W. Mackie, Prof. H. W. Shepherd, Prof. H. E. McMinn, Dr. H. L. Mason, Mr. L. L. Edmunds, Dr. L. Constance, and others.

May 21, 1942. Speaker: Mr. C. R. Quick, Division of Plant Disease Control, United States Department of Agriculture. Subject: Certain methods of forcing seed germination. The speaker presented a classification of the difficulties which may be encountered in the germination of seeds, and discussed methods of obviating the several types of difficulties enumerated. Data representing the successful growth of hard-to-germinate seeds were presented on lantern slides. About 25 members and friends of the Society attended. C. R. Quick, Secretary.